CLAIMS

1. Process for controlling the supply of high pressure (HP) gasoline of a set of injectors connected to a common high pressure chamber, called a "common rail" C in a direct fuel injection circuit, called DFI, by a high pressure pump (P), by acting on the low pressure (LP) supply of said pump (P) by means of a slide electrovalve (E), controlled by the computer managing the operation of the motor, consisting in providing, within the interior of the electrovalve (E) one or several internal leakages, either of the high pressure toward the low pressure, or of the low pressure upstream of the electrovalve (E) toward the downstream low pressure which permits regulating the particular problems which arise for the three following modes of operation of the motor: motor braking, motor stopping, idling.

2. Process according to claim 1 consisting in recycling toward the BP supply conduit of the pump (P) the internal leakages of the electrovalve (40) from the low and/or the high pressure.

3. Process according to claim 2 permitting overcoming the high pressure remaining in the common rail (C) in the case in which the motor is stopped and assuring a zero flow rate in the case of motor braking, consisting in using means (41, 42) providing a leakage flow rate from the high pressure (32) toward the low pressure (23) such that when a zero gasoline flow rate to the injectors is required, the outlet flow rate of the pump is zero and if necessary the high pressure remaining can leak toward the low pressure.

4. Process according to claim 3 consisting in using for the regulation of the low pressure supply of the pump (P), bringing the gasoline to high pressure, an electrovalve (40) with a slide (43) and in connecting the high pressure output collector (32) of the pump (P) to said electrovalve (40) so as to obtain through said electrovalve (40) a high pressure leakage flow rate which is recycled toward the low pressure by said electrovalve.

5. Device for regulation of the gasoline supply of a direct injection motor of the type comprising: a low pressure gasoline supplied by a pump (B); a high pressure pump (P) and means (E) regulating the gasoline supply of said pump (P) upstream of the latter, characterized by the fact that the regulation means is an electrovalve (40) with a slide (43) sliding in a skirt (42), this electrovalve regulating the low pressure gasoline flow rate which passes through it in the direction of the pump and recycling, by internal leakage, a portion of the high pressure toward the low pressure.

6. Device according to claim 5 in which the electrovalve (40) is traversed from side to side by a central hole (48) which runs from the inlet of the electrovalve to a chamber (49) located at its other end, this central hole communicating by an internal leakage with a throat (47) connected by a branch (32a) to the channel (32) collecting the high pressure flow rate supplied by the pump (P).

7. Device according to claim 6 in which there exists between the skirt (42) and the slide (43) of the electrovalve (40) a space creating on the one hand a flow rate of low pressure gasoline leakage and on the other hand a flow rate of high pressure leakage, the first being evacuated toward the

supply channel (22) of the pump and a second being recycled toward the low pressure by a central hole (48) passing through the slide (43) from side to side.

8. Device according to claim 1 in which the relative dimensions of the pieces are selected such that the leakage flow rate of the high pressure toward the low pressure will always be greater than the limit equal to the leakage flow rate of the low pressure.

9. Device according to claim 5 characterized by the fact that a non-return flap valve (50) controlled by the electromagnet (45) of the electrovalve (40) is inserted between the low pressure upstream and the low pressure downstream of this electrovalve (40); so as to be able to obtain a zero flow rate during braking of the motor.

10. Device according to claim 9 in which the non-return flap valve is held on its seat by a spring (52) disposed between the ball (50) and a support (53), provided with openings (54), bearing against the end of the slide (43).

11. Device according to claim 10 in which in its rest position, the ball (50) rests in sealed manner on its seat and the inlet opening (42a) for low pressure to the electrovalve (40) is closed by the slide (43).

12. Device according to claim 11, in which the sealing cross-section of the ball is calculated such that its opening force will be equal to the emplacement force of the spring (44).

13. Device according to claim 1, in which there exists between the skirt (42) and the slide (43) a space (47a) creating a leakage flow from the high pressure (32a) toward the low pressure (49).

14. Device according to claim 5 characterized by the fact that the return spring (44) of the slide (43) is disposed in a deformable cage (60, 61), disposed in a chamber (64) into which opens the inlet channel (23) of the low pressure, the upper portion (60) of this cage closing or opening an opening (62) connected by a channel (63) to the common rail (C) such that in the absence of high pressure from the pump (P), the low pressure gasoline from the channel (23) can pass directly to said common rail (C) through the channel (63) short-circuiting the pump (P).

15. Device according to claim 14 in which the size of the opening (62) and the calibration of the spring (44) are determined such that the maximum HP pressure in the channel (63) multiplied by the cross-section of the opening (62) will be less than the emplacement load of the spring.

16. Device according to claim 15 in which the opening (62) comprises a seat (65) against which the movable portion (60) of the deformable cage (60/61) will rest; said seat (65) being traversed by one or several calibrated conduits so as to ensure through said seat (65) a permanent calibrated leakage.

17. Device according to claims 5 to 8 and 13 to 16 comprising, for the control of the LP supply of the pump (P): an electrovalve (40) whose slide (43-100) is actuated by a motor (45-101); the LP arriving at the electrovalve through a channel (23-102) opening into a chamber (64-103) where there is located

a spring (44-107) counteracting the slide (43-100) and being directed to the pump (P) through a channel (23a-105), the internal leakage of the upstream LP toward the downstream LP that takes place between the chamber (64-103) and the common rail (C) taking place through a flap valve (60/61-110) controlled by the movements of the slide (43-108) with addition of a permanent calibrated leakage flow rate either through said flap valve (60/61) or beside the latter through a calibrated passage (113).